

Estimating the Number of People in Poverty for the Program Access Index: The American Community Survey vs. the Current Population Survey

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Background

The Program Access Index (PAI) is one of the measures the Food and Nutrition Service (FNS) uses to reward States for high performance in the administration of the Food Stamp Program. The PAI offers an indication of the degree to which low-income people have access to food stamp benefits. It is calculated as the ratio of the average monthly number of food stamp participants to the number of people with income below a percentage of poverty in each State.¹ Each year, FNS distributes \$12 million among the four States with the highest PAI and the four States with the largest improvement from the previous year.

FNS currently uses estimates of the size of the poverty population derived from the Annual Social and Economic Supplement to the Current Population Survey (CPS) fielded each March. While the CPS provides a representative sample for each State, the household samples in many States are relatively small, and the Census Bureau recommends use of 3-year averages for State-to-State comparisons and 2-year averages for year-to-year changes. The statute authorizing performance awards, however, requires that each award reflect performance in the previous fiscal year and so precludes use of a combined average across years. The calculation of the PAI, therefore, is based on the sample from a single CPS each year. This reduces the precision and increases the variability of the State estimates.

The American Community Survey (ACS) is a new survey administered by the Census Bureau, replacing the long-form questionnaire from the Decennial Census. Starting this year, data will be available annually for all areas with populations of 65,000 or more. In the United States and Puerto Rico, about 250,000 addresses per month, or 2.5 percent of the population per year, will receive the survey. This is equal to about 1-in-40 addresses a year, providing State samples that are substantially larger than those in the CPS.

In the proposed and final rulemaking that established the performance awards, FNS noted that we were considering use of the ACS in place of the CPS because of its larger sample, but that we needed to examine these relatively new data more carefully, and reserved the right to use new and better data for the calculation of the PAI should it become available. This paper presents a comparison of the two surveys as a source of data for the PAI calculation and illustrates the potential effects of moving to the ACS.

¹ Calculations for the 2003 and 2004 performance awards used the number of people with income below 100 percent of poverty as the denominator of the PAI; beginning with the 2005 awards, the PAI will be based on the number of people with income below 125 percent of poverty.

Table 1. A Comparison of the American Community and Current Population Surveys

	American Community Survey	Current Population Survey
Principal Purpose	A nationwide survey designed to give communities current and accurate information every year about their demographic, socio-economic and housing characteristics.	Primary source of information on the labor force characteristics of the U.S. population. The Annual Social and Economic Supplement is the source of official poverty estimates.
Universe	U.S. non-institutional population (excluding group quarters)	U.S. civilian non-institutional population (including group quarters)
Collection Method	Mail, telephone, personal visit	Telephone or personal visit
Sample Size	About 3 million households per year starting January 2005	About 100,000 households
Geography	Nation, States, cities, counties, metropolitan areas, and population groups of 65,000 people or more	Nation and States
Frequency of Data Collection	Monthly throughout the year	March of each year
Reference Period for Income	12 months preceding interview, adjusted to calendar year of interview month	Previous calendar year
Income Detail	Probes for income in 8 categories	Probes for income in 20 categories
Timeliness	File and summary tables available August each year.	File and summary tables available August each year.

A Comparison of Key Survey Features

Table 1 provides an overview of the most relevant features of the ACS and CPS.²

The ACS is similar to the CPS in several important respects. Both collect demographic and economic information annually from a sample of households. Data are released within the calendar year following its collection. Both can be used to estimate the size of the poverty population for the nation as a whole and for each State.

The ACS also differs from the CPS in several important respects:

- The ACS is the largest survey in the nation. With full implementation the annual sample will be about 3 million households, many times larger than the 100,000 households sampled in

² For a more complete discussion of the similarities and differences between the ACS and the CPS in the context of estimating poverty rates, see Bishaw, A. and S. Stern (2006), *Evaluation of Poverty Estimates: A Comparison of the American Community Survey and the Current Population Survey*. U.S. Census Bureau, June 15 (available on-line at www.census.gov/hhes/www/poverty/acs_cpspovcompreport.pdf).

the CPS. The large sample can be expected to increase the precision of estimates from the ACS.

- The ACS collects data from both the civilian and military populations but excludes residents of group quarters. The CPS collects data from the civilian non-institutional population, including people living in non-institutional group quarters (such as college dormitories, emergency and transitional shelters, worker dormitories, and group homes). The ACS is scheduled to include group quarters in 2006.
- The ACS interviews everyone who is in the sample housing unit on the day of interview who is living or staying there for more than two months. The CPS interviews everyone staying in the housing unit at the time of the interview who considers the housing unit as their usual residence.
- Although both surveys collect measures of annual income, the CPS estimate is tied to the previous calendar year (every interview occurs in March), while the ACS estimate is tied to the previous 12 months (which vary depending on the date of the interview). The reported ACS income data are adjusted with the Consumer Price Index to reflect the calendar year in which the interview occurs.³
- The CPS collects income information with a richer and more detailed set of questions than does the ACS, and may, as a result, offer more accurate estimates of household income.
- Participation in the ACS is mandatory, while participation in the CPS is voluntary. This has yielded higher response rates and should lead to better quality information in the ACS.

The Level and Precision of Poverty Estimates

Estimates of the number of low-income people from the ACS and CPS have been quite close for the nation as a whole in recent years, as shown in Table 2:

Source of Estimate	2001	2002	2003	2004
CPS	45,320	47,084	48,687	49,667
ACS	45,075	46,206	48,031	49,840
Difference (CPS – ACS)	245	878	656	-173
Percent difference	0.5%	1.9%	1.4%	-0.4%

Note: All population counts are in thousands.

³ This adjustment is based on the difference between the average Consumer Price Index (CPI) for the household's 12-month reference period and the calendar year of the interview. For example, a household that is interviewed in July 2006 would have an income reference period of July 2005 to June 2006. Income estimates for this household

Differences in the State-level poverty estimates were much larger in some cases (see Table 3). The ACS-based State estimates of the number of people with income less than 125 percent of poverty ranged from 17 percent less to 31 percent more than the CPS-based estimates in 2003; the estimates ranged from 42 percent less to 24 percent more in 2004.⁴

- For 2003, ACS produced statistically significantly higher estimates compared to the CPS for the States of Idaho, New Hampshire, Mississippi and Ohio, and significantly lower estimates for the States of Maine and Massachusetts.
- For 2004, ACS produced statistically significantly higher estimates compared to the CPS for the States of Idaho, Oklahoma, Hawaii, New Hampshire and West Virginia, and significantly lower estimates for the States of Connecticut and Alaska.

Although some of these differences are large, it is important to remember that the ACS has a much larger sample than the CPS, and that the ACS-based estimates are more precise than the CPS-based estimates. Thus, some (perhaps even most) of the difference between the two sets of estimates is caused by the imprecision of the estimates based on a single year's sample from the CPS. In 2004, for example, the ACS sample consisted of nearly 570,000 completed interviews compared to 76,000 for the CPS.⁵ The number of completed interviews in the ACS sample was more than 7 times larger than the CPS sample, and from 3 to 12 times larger than the CPS sample in individual States (see Table 4). This differential will only grow larger as the ACS expands to its full sample of about 3 million households.

The larger ACS samples contribute to significant improvements in the standard error – a measure of statistical precision – of the estimates of the number of persons below 125 percent of poverty. The 2004 ACS sample was only a fraction of the full ACS sample expected starting in 2005. Nevertheless, the ACS-based standard errors were smaller – and therefore the estimates were more precise – in every State, and in many States the standard error was substantially smaller (also shown in Table 4). In the median State, the standard error based on the ACS sample was about half the size of the standard error based on the CPS sample. Thus, in roughly half of all the States, the larger ACS sample cuts the size of the standard error of the estimated number of low-income people by at least half. The improvement in the standard errors can be expected to grow even larger as the ACS expands to its full sample. More precise estimates increase the possibility that the State-by-State estimates and rankings reflect the true value of the PAI.

are expressed in calendar year 2006 dollars, based on the difference between the average CPI for July 2005 - June 2006 and January 2006 - December 2006.

⁴ A Census Bureau analysis comparing ACS and CPS data for 2003 concluded that State poverty rates were the same in ACS and CPS for 36 States. Of the remaining, the ACS estimated higher poverty rates than the CPS in 12 States and lower poverty rates in 2 States and the District of Columbia. The absolute value of the differences was less than 0.5 percentage points, which leaves open the question of whether these observed differences represent meaningful differences.

⁵ Note that the ACS did not reach its full sample size until 2005; the 2004 sample of 570,000 interviews is substantially less than expected once the survey is fully implemented. Thus, the State samples in the 2005 and 2006 ACS will be even larger than the samples in the CPS. (See Bishaw and Stern (2006), cited in footnote 2 above.)

Table 3. Estimated Number of People with Income Less Than 125 Percent of Poverty

State	2003				2004			
	CPS	ACS	Difference	Percent	CPS	ACS	Difference	Percent
Alabama	855,000	952,000	97,000	11.3	1,002,000	935,000	67,000	6.7
Alaska	88,000	84,000	-4,000	-4.5	87,000	70,000	17,000	19.5
Arizona	1,067,000	1,132,000	65,000	6.1	1,090,000	1,122,000	-32,000	-2.9
Arkansas	594,000	546,000	-48,000	-8.1	588,000	625,000	-37,000	-6.3
California	6,441,000	6,296,000	-145,000	-2.3	6,526,000	6,435,000	91,000	1.4
Colorado	615,000	578,000	-37,000	-6.0	614,000	679,000	-65,000	-10.6
Connecticut	380,000	350,000	-30,000	-7.9	471,000	359,000	112,000	23.8
Delaware	89,000	91,000	2,000	2.2	109,000	109,000	0	0.0
Dist. of Col.	113,000	129,000	16,000	14.2	127,000	117,000	10,000	7.9
Florida	2,940,000	2,928,000	-12,000	-0.4	2,855,000	2,869,000	-14,000	-0.5
Georgia	1,385,000	1,521,000	136,000	9.8	1,583,000	1,681,000	-98,000	-6.2
Hawaii	160,000	167,000	7,000	4.4	139,000	171,000	-32,000	-23.0
Idaho	190,000	248,000	58,000	30.5	198,000	282,000	-84,000	-42.4
Illinois	2,055,000	1,858,000	-197,000	-9.6	1,989,000	1,976,000	13,000	0.7
Indiana	932,000	899,000	-33,000	-3.5	976,000	914,000	62,000	6.4
Iowa	377,000	392,000	15,000	4.0	442,000	423,000	19,000	4.3
Kansas	372,000	416,000	44,000	11.8	398,000	405,000	-7,000	-1.8
Kentucky	822,000	910,000	88,000	10.7	942,000	907,000	35,000	3.7
Louisiana	1,010,000	1,104,000	94,000	9.3	944,000	1,058,000	-114,000	-12.1
Maine	224,000	187,000	-37,000	-16.5	204,000	211,000	-7,000	-3.4
Maryland	645,000	601,000	-44,000	-6.8	689,000	607,000	82,000	11.9
Massachusetts	891,000	759,000	-132,000	-14.8	811,000	755,000	56,000	6.9
Michigan	1,507,000	1,480,000	-27,000	-1.8	1,702,000	1,615,000	87,000	5.1
Minnesota	521,000	508,000	-13,000	-2.5	491,000	558,000	-67,000	-13.6
Mississippi	604,000	722,000	118,000	19.5	717,000	790,000	-73,000	-10.2
Missouri	814,000	900,000	86,000	10.6	942,000	923,000	19,000	2.0
Montana	205,000	178,000	-27,000	-13.2	183,000	179,000	4,000	2.2
Nebraska	249,000	244,000	-5,000	-2.0	261,000	260,000	1,000	0.4
Nevada	371,000	340,000	-31,000	-8.4	342,000	389,000	-47,000	-13.7
New Hampshire	103,000	132,000	29,000	28.2	103,000	131,000	-28,000	-27.2
New Jersey	997,000	946,000	-51,000	-5.1	913,000	949,000	-36,000	-3.9
New Mexico	451,000	463,000	12,000	2.7	411,000	467,000	-56,000	-13.6
New York	3,558,000	3,287,000	-271,000	-7.6	3,541,000	3,389,000	152,000	4.3
North Carolina	1,704,000	1,536,000	-168,000	-9.9	1,607,000	1,686,000	-79,000	-4.9
North Dakota	90,000	96,000	6,000	6.7	88,000	102,000	-14,000	-15.9
Ohio	1,553,000	1,761,000	208,000	13.4	1,762,000	1,812,000	-50,000	-2.8
Oklahoma	635,000	728,000	93,000	14.6	560,000	724,000	-164,000	-29.3
Oregon	585,000	656,000	71,000	12.1	606,000	661,000	-55,000	-9.1
Pennsylvania	1,721,000	1,739,000	18,000	1.0	1,883,000	1,843,000	40,000	2.1
Rhode Island	151,000	149,000	-2,000	-1.3	166,000	168,000	-2,000	-1.2
South Carolina	745,000	801,000	56,000	7.5	810,000	825,000	-15,000	-1.9
South Dakota	126,000	108,000	-18,000	-14.3	136,000	117,000	19,000	14.0
Tennessee	1,213,000	1,061,000	-152,000	-12.5	1,236,000	1,113,000	123,000	10.0
Texas	5,018,000	4,672,000	-346,000	-6.9	4,835,000	4,804,000	31,000	0.6
Utah	312,000	315,000	3,000	1.0	310,000	351,000	-41,000	-13.2
Vermont	81,000	84,000	3,000	3.7	76,000	77,000	-1,000	-1.3
Virginia	947,000	881,000	-66,000	-7.0	980,000	938,000	42,000	4.3
Washington	955,000	857,000	-98,000	-10.3	966,000	1,020,000	-54,000	-5.6
West Virginia	420,000	426,000	6,000	1.4	364,000	414,000	-50,000	-13.7
Wisconsin	736,000	743,000	7,000	1.0	823,000	759,000	64,000	7.8
Wyoming	67,000	71,000	4,000	6.0	69,000	69,000	0	0.0

Table 4. Comparison of Sample Sizes and Standard Errors in 2004

State	Sample Size				Standard Error			
	CPS	ACS	Difference	Ratio	CPS	ACS	Difference	Ratio
Alabama	1,070	7,162	6,092	6.7	66,000	30,000	-36,000	0.455
Alaska	1,029	3,981	2,952	3.9	8,000	5,000	-3,000	0.625
Arizona	1,060	12,797	11,737	12.1	76,000	38,000	-38,000	0.500
Arkansas	874	4,533	3,659	5.2	41,000	26,000	-15,000	0.634
California	5,833	50,472	44,639	8.7	188,000	100,000	-88,000	0.532
Colorado	1,552	7,370	5,818	4.7	58,000	33,000	-25,000	0.569
Connecticut	1,503	5,543	4,040	3.7	43,000	20,000	-23,000	0.465
Delaware	1,061	4,631	3,570	4.4	10,000	6,000	-4,000	0.600
Dist. of Col.	1,122	3,707	2,585	3.3	10,000	7,000	-3,000	0.700
Florida	3,358	35,684	32,326	10.6	119,000	60,000	-59,000	0.504
Georgia	1,431	12,646	11,215	8.8	86,000	47,000	-39,000	0.547
Hawaii	1,149	4,304	3,155	3.7	14,000	14,000	0	1.000
Idaho	855	4,143	3,288	4.8	18,000	14,000	-4,000	0.778
Illinois	2,583	22,681	20,098	8.8	100,000	60,000	-40,000	0.600
Indiana	1,380	10,852	9,472	7.9	68,000	34,000	-34,000	0.500
Iowa	1,250	9,675	8,425	7.7	39,000	14,000	-25,000	0.359
Kansas	1,228	7,112	5,884	5.8	36,000	16,000	-20,000	0.444
Kentucky	1,138	10,672	9,534	9.4	63,000	28,000	-35,000	0.444
Louisiana	795	9,122	8,327	11.5	64,000	33,000	-31,000	0.516
Maine	1,339	4,342	3,003	3.2	19,000	11,000	-8,000	0.579
Maryland	1,479	10,054	8,575	6.8	60,000	27,000	-33,000	0.450
Massachusetts	1,274	12,747	11,473	10.0	63,000	27,000	-36,000	0.429
Michigan	2,087	17,219	15,132	8.3	90,000	47,000	-43,000	0.522
Minnesota	1,545	8,886	7,341	5.8	50,000	24,000	-26,000	0.480
Mississippi	755	9,042	8,287	12.0	45,000	22,000	-23,000	0.489
Missouri	1,243	9,911	8,668	8.0	68,000	34,000	-34,000	0.500
Montana	787	5,102	4,315	6.5	14,000	7,000	-7,000	0.500
Nebraska	1,148	8,108	6,960	7.1	23,000	9,000	-14,000	0.391
Nevada	1,221	4,305	3,084	3.5	32,000	24,000	-8,000	0.750
New Hampshire	1,245	4,518	3,273	3.6	13,000	8,000	-5,000	0.615
New Jersey	1,680	12,824	11,144	7.6	70,000	36,000	-34,000	0.514
New Mexico	929	4,387	3,458	4.7	31,000	20,000	-11,000	0.645
New York	3,473	33,308	29,835	9.6	133,000	63,000	-70,000	0.474
North Carolina	1,669	13,231	11,562	7.9	87,000	59,000	-28,000	0.678
North Dakota	942	4,489	3,547	4.8	8,000	6,000	-2,000	0.750
Ohio	2,279	25,779	23,500	11.3	93,000	47,000	-46,000	0.505
Oklahoma	904	5,531	4,627	6.1	47,000	26,000	-21,000	0.553
Oregon	1,111	9,574	8,463	8.6	52,000	23,000	-29,000	0.442
Pennsylvania	2,470	23,138	20,668	9.4	96,000	49,000	-47,000	0.510
Rhode Island	1,318	4,571	3,253	3.5	15,000	9,000	-6,000	0.600
South Carolina	998	6,714	5,716	6.7	60,000	31,000	-29,000	0.517
South Dakota	1,176	6,251	5,075	5.3	10,000	5,000	-5,000	0.500
Tennessee	1,047	10,068	9,021	9.6	75,000	35,000	-40,000	0.467
Texas	3,771	32,806	29,035	8.7	160,000	86,000	-74,000	0.538
Utah	989	4,273	3,284	4.3	28,000	21,000	-7,000	0.750
Vermont	1,038	4,562	3,524	4.4	8,000	4,000	-4,000	0.500
Virginia	1,487	12,069	10,582	8.1	70,000	37,000	-33,000	0.529
Washington	1,367	11,235	9,868	8.2	70,000	33,000	-37,000	0.471
West Virginia	965	7,798	6,833	8.1	24,000	15,000	-9,000	0.625
Wisconsin	1,451	10,892	9,441	7.5	64,000	32,000	-32,000	0.500
Wyoming	929	4,145	3,216	4.5	7,000	3,000	-4,000	0.429

Survey Effects on the Program Access Index

Replacing the CPS-based estimates of the number of people with low-income with ACS-based estimates would have had very modest effects on the overall level of the PAI for the nation as a whole in recent years, as shown in Table 5. The calculated PAIs from the two surveys are very close to each other, and both are somewhat less than the standard estimates of participation rates among people eligible for food stamp benefits.⁶

Source of Estimate	2002	2003	2004
CPS	.418	.453	.490
ACS	.426	.459	.489
Difference (CPS-ACS)	-.008	-.006	.001
Participation Rate Among Eligibles	0.538	0.556	.605

Table 6 shows that the rank order of States based on the PAI using the ACS and the CPS is highly correlated and that each is highly correlated with the rank order of States based on participation rates among eligibles. The rank order correlation exceeds 0.85 in all cases (a perfect match would equal 1.00). This means that a State's rank on one measure is strongly, but not perfectly, associated with its rank on the other measure. States with high rankings based on the more refined estimates of participation rates among eligibles also tend to have high rankings based on the simpler ratio of participants to people in poverty, whether based on the ACS or on the CPS.

	CPS PAI vs. Participation Rate	ACS PAI vs. Participation Rate	CPS PAI vs. ACS PAI
2002	.88	.91	.93
2003	.90	.87	.91
2004	N/A	N/A	.87

Survey Effects on State Rankings and Performance Awards

Replacing the CPS-based estimates of the number of people will also affect State rankings based on the PAI and, ultimately, the set of States that receive performance awards. Some States that

⁶ See *A User's Guide to Measures of Food Stamp Program Participation Rates* (available at www.fns.usda/oane) for a discussion of the differences between the Performance Access Index and estimates of participation among eligibles.

rank in the top four under the CPS-based measure may not rank in the top four under the ACS-based measure, and vice versa. To illustrate these effects, we calculated the PAI for 2002, 2003, and 2004 using the procedures set forth in the final rulemaking of February 2005 and data from the CPS and the ACS.⁷ We then ranked States by the level of performance on the index in all three years and by the level of improvement between 2002 – 2003 and 2003 – 2004. We also compared the State rankings based on the PAI to their rankings based on the estimated participation rate among eligibles when available (2002 and 2003).

Several key points emerge from these comparisons (see Tables 7 and 8):

- Neither the CPS- nor ACS-based PAI precisely replicate the rank ordering of States based on the estimated participation rate among eligibles. There was substantial overlap in the rankings based on overall levels of performance (2 to 3 States out of four each year), but less overlap in the rankings based on improvements in performance (only 1 State for the single period where comparisons are possible). While the PAI is a useful proxy for the more refined estimate, it is not a perfect proxy. Moreover, neither survey-based PAI is consistently better than the other in replicating the rank order of participation rates over this limited time period.
- The ACS-based PAI does not precisely replicate the rank ordering of States based on the CPS. The overlap in rankings appears to be somewhat larger for the rankings based on overall levels of performance than for improvements in performance. If the ACS had been in place during prior periods, a different set of States would have qualified for performance awards; while past performance can not predict future results with certainty, it is likely that replacing the CPS-based PAI with an ACS-based PAI will result in a different mix of qualifying States in the years ahead.

Conclusion

Switching to the American Community Survey would address an area of concern in the current calculations of the number of low-income people in each State (the denominator of the Program Access Index). Because the ACS sample is substantially larger than the CPS sample in any single year, ACS-based estimates will be substantially more precise and subject to less error than the CPS-based estimates.

Use of the ACS would not result in any significant change in aggregate estimates of the number of people in with income less than 125 percent of poverty or in the calculated level of the PAI. It would result in some changes in the rankings of individual States (at least among the top 4 in overall and most improved performance). There is no clear standard for comparison to indicate which is the “right” set of States to reward. Because the ACS has higher response rates, smaller sampling errors, and higher coverage rates than the CPS, ACS-based estimates are likely to be more accurate, reliable and stable, and therefore result in a more equitable distribution of performance awards.

⁷ The calculations reported here differ from those used to make performance awards in several important respects, chief among them the use of the number of people with income less than 125 percent of poverty – in place of 100 percent – in the denominator of the PAI. Our goal was to replicate the procedures that will be used in future years.

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Table 7. Top Ranked States Base on Overall Measures

	State Rank Based On Overall Level Of:		
	Participation Rate	CPS PAI	ACS PAI
2002			
Oregon	1	2	5
Hawaii	2	8	1
West Virginia	3	5	6
Missouri	4	1	4
Alaska	12	3	2
District of Columbia	8	4	3
2003			
Oregon	1	3	5
Tennessee	2	9	2
Missouri	3	1	3
District of Columbia	4	2	4
Maine	5	10	1
Louisiana	6	4	6
2004			
Oklahoma	N/A	1	12
Missouri	N/A	2	1
Louisiana	N/A	3	6
West Virginia	N/A	4	8
Alaska	N/A	11	2
District of Columbia	N/A	8	3
Tennessee	N/A	9	4

Note: Ranks of top four States are in **bold**.

Table 8. Top Ranked States Based on Measures of Improvement

	State Rank Based On Improvement In:		
	Participation Rate	CPS PAI	ACS PAI
2002 to 2003			
Tennessee	1	20	2
Arizona	2	14	26
Georgia	3	36	23
Oklahoma	4	1	14
Mississippi	18	2	29
District of Columbia	11	3	42
Delaware	22	4	5
Maine	5	7	1
South Dakota	48	49	3
Washington	24	21	4
2003 to 2004			
Oklahoma	N/A	1	18
New Mexico	N/A	2	8
West Virginia	N/A	3	20
Louisiana	N/A	4	4
Alaska	N/A	14	1
District of Columbia	N/A	48	2
Missouri	N/A	37	3

Note: Ranks of top four States are in **bold**.